

Student Name:

Stud id:

sect #: serial#:

University of Bahrain

College of Information Technology
Department of Computer Science

ITCS332: Concepts of Programming Languages

Quiz#5: Chapter 6_Types

- 1) Write an example of C++ code that illustrates (creates) lost heap dynamic variable.

```
void      *p1;

p1 = new int(10);

p1 = new float(7.4); // heap location that contains 10 is lost.
```

- 2) Give two differences between the arrays and the records.

- a) Arrays consist of **homogeneous** elements while records consist of **heterogeneous** elements.
- b) Array elements are accessed using **indices**, while record elements are accessed using **names**.

- 3) Given a matrix **U**: **array [30 .. 100][20 .. 80] of FLOAT**; starting address of array is 7060; element size is 3 bytes. Assuming column major ordering, calculate the address of matrix element **U[80][55]**.

7060 + [(55-20)*(100-30+1) + (80-30)]* 3

Fill in blanks

- 4) In C++, subscripts can be of **integer** type only; while in PASCAL, subscripts can be of any **ordinal** type.
- 5) The two mechanisms used to detect and solve dangling pointers are: **Tombstones** and **Locks and Keys**.
- 6) An element of associative array consists of **a data value and a key**; while an element of a regular array consists of **a data value only**.
- 7) In PROLOG, each statement is terminated by a dot is decided by **Language Designer**. In C++, a value of type double occupies 8 bytes is decided by **Language Implementer**.
- 8) In regular arrays, array elements are accessed using **indices**, while in associative array elements are accessed using **keys**.

Student Name:

Stud id:

sect #: serial#:

University of Bahrain

College of Information Technology
Department of Computer Science

ITCS332: Concepts of Programming Languages

Quiz#5: Chapter 6_Types

- 9) Write an example of C++ code that illustrates (creates) a dangling pointer.

```
double    *p1,*p2;
p1 = new double(55.75);
p2 = p1;
delete p1;    // p2 is a dangling pointer
```

- 10) Give two differences between the associative and regular arrays.

- a) Regular arrays consist of **ordered** elements while associative arrays consist of **unordered** elements.
- b) Regular arrays are of **fixed size**, while associative arrays are of **variable size**.

- 11) Given a matrix **U: array[100 .. 180][200 .. 250] of double;** starting address of array is 3040; element size is 5 bytes. Show ALL your calculations. Assuming row major ordering, calculate the address of matrix element U[125] [211].

3040 + [(125-100)*(250-200+1) + (211-200)]* 5

Fill in blanks

- 12) Using tombstones or locks and keys in solving dangling pointer problem is decided by **Language Implementer** ; while using % symbol to reference record members in FORTRAN95 is decided by **Language designer**.
- 13) In programming languages, array indices are enclosed between **square brackets[]** or **parenthesis ()**.
- 14) The heap space is managed using a **free space list** which is implemented as a **linked list**.
- 15) In programming languages, garbage collection algorithm can be implemented using **mark and sweep** or **copy and write** technique.
- 16) The two forms of references to record fields are **fully-qualified** and **elliptical**.

- 1) The allocation and de-allocation of space to arrays in JAVA. _____.
 - 2) Decimal date type is included in COBOL. _____.
 - 3) Strings length is static or dynamic. _____.
 - 4) Strings are of primitive or structured type. _____.
 - 5) _____.
- 17) **By whom each of the following is decided?**
- a) C++ pointers are defined using * symbol. **Language Designer.**
 - b) PASCAL subscripts can be on any ordinal type. **Language Designer**
 - c) A Prolog statement is terminated by a dot. **Language Designer.**
- 18) **Who is responsible for each of the following:**
- a) Pointers are included in C# and excluded from JAVA. **Language Designer.**
 - b) The syntax used to reference members in records. **Language Designer.****
 - c) Strings are implemented using adjacent memory cells or linked list.
Language Implementer.
 - d) Generating range-checking code for every assignment to a subrange variable.
Language Implementer.
- 19) **By whom each of the following is decided?**
- a) Using adjacent memory cells / linked list in implementing strings.
Language Implementer
 - b) Generating range-checking code for every assignment to a subrange variable is performed by.
Language Compiler.
 - c) In C++, row-major ordering of multi-dimensional arrays is selected by
Language Implementer.
 - d) Using tombstones or locks and keys in solving dangling pointer problem.
Language Implementer
 - e) Generating range-checking code for every assignment to a subrange variable.
Language Translator
 - f) C++ array index is enclosed in square brackets []. **Language Designer**
 - g) FORTRAN95 uses % symbol to reference record members. **Language Designer**